



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|------------------------------|------------------------|
| 10/735,270 | 12/12/2003 | James B. Piket | 33692.03.1429 | 3597 |
| 23418 7590 12/07/2007 VEDDER PRICE KAUFMAN & KAMMHOLZ 222 N. LASALLE STREET CHICAGO, IL 60601 | | | EXAMINER JAMAL, ALEXANDER | |
| | | | ART UNIT 2614 | PAPER NUMBER |
| | | | MAIL DATE 12/07/2007 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/735,270

Applicant(s)

PIKET ET AL.

Examiner

Alexander Jamal

Art Unit

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Based upon the submitted arguments, the examiner notes that no claims have been amended, only arguments submitted.
2. Examiner withdraws the objections to the drawings.

Specification

1. The disclosure is objected to because of the following informalities:

The examiner has considered applicant's response to the objection to the specification but notes that the applicant's has not addressed all issues.

1. Applicant states (remarks page 2) that Coefficient logic 218 uses the pre echo canceller uplink data and pre-noise suppression uplink data to generate coefficient data to be passed to Echo canceller filter 216 in order to model the acoustic coupling between the microphone and speaker. How is this done without using the downlink data? Neither logic 218 or filter 216 receive any downlink data. In applicant's Fig. 4, only prenoise suppression filter 462 uses the downlink data. How is an echo to be modeled and cancelled without using the downlink data?

2. On page 3 of applicant remarks, applicant states that the echo canceller filter 216 may perform the adaptive filter function on uplink data 228 by applying coefficient

data 226. How is this done? What is the 'adaptive filter function' to be used. It is not clear what functional block 216 is doing.

3. On the bottom of remarks page 3, applicant repeatedly states that the generation of filter coefficient data is unaffected by the noise suppression stage and vice-versa, but applicant does not explain exactly what the filter 216 is doing. How does it function using only inputs 228 and 226? How are signals 214,226 manipulated to produce signal 230?

4. How does the coefficient generator 220 generate coefficients based upon the echo path without using any of the downlink data signal ?

5. How is the second echo canceller adaptive filter 84 (Fig. 1) model the echo without using downlink data 52?

6. Where does signal 94 go, and what does it do (Fig. 1). Where does signal 96 come from, how is it created?

7. It is not clear what the amplifier 430 in Fig. 4 is doing with the two input signals. Are the signals combined? amplified separately? Selected? Applicant states that one skilled in the art would understand that they 'could also receive playback audio signals as well'. Examiner contends that one skilled in the art would not know exactly how D/A 440, and audio sources 434,436,438 are simultaneously coupled to amplifier 430.

For the purpose of examination, examiner assumes applicant can overcome the rejection and the systems shown in Figs. 1,3,4 are shown correctly.

Appropriate correction/clarification is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-6,9-11,18-23** rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (Fig. 1), and further in view of Sih (5646991).

As per **claim 1**, Applicant's admitted prior art discloses an echo canceller circuit comprising (Fig. 1), Pre-Noise suppression logic (blocks 80, and 82), echo canceller coefficient logic (inherently comprised in block 84 for the purpose of performing the echo cancel function of block 84). Block 84 further comprises an echo canceller filter (as named in the block) that is coupled to noise suppression logic 20, and must inherently be coupled to the coefficient logic in order to perform the echo canceling function. The prior art discloses noise suppression stage 20 after the second echo cancellation stage. However, applicant's admitted prior art does not show a noise suppression stage coming after the 'pre-noise suppression logic' but before the echo canceller filter.

Sih discloses an acoustic echo canceller (Fig. 5) comprising noise suppressor 146 coupled before the echo canceller. Sih teaches that this filter is a noise remover

(suppressor) that removes background noise (Col 9 lines 15-35). It would have been obvious to one of ordinary skill in the art at the time of this application to implement a high pass filter noise suppressor before either echo cancellation stage in order to remove a portion of the background noise. Examiner notes that applicant's prior art discloses the use of cascaded noise removing techniques in order to achieve the most noise free signal as possible.

As per **claim 5**, it is rejected as per the claim 1 rejection. Applicant's admitted prior art Fig. 1 discloses adder 82 coupled to second echo canceller 84 that inherently comprises coefficient logic.

As per **claims 9,18,22** it is rejected as per the claim 1 rejection. Applicant's admitted prior art may be implemented in a car audio system that inherently requires a 'housing' to support the circuitry. Applicant's prior art figure 1, when implemented in an audio system requires a transceiver for the purpose of generating or interfacing with the uplink and downlink data. The digital filters of applicant's admitted prior art inherently comprise microprocessors with software comprising the method to be performed by the hardware, for the purpose of controlling the digital processing hardware.

As per **claims 2-4,19-21.23** they are rejected as per the claim 9 rejection.

As per **claim 6,11**, it is rejected as per the claim 9 rejection.

As per **claim 10**, the car phones disclosed in applicant's admitted prior art specification inherently comprise wireless transceivers for the purpose of being able to operate in the car.

4. **Claims 13-17** rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al (US20040078104A1) in view of Applicant's admitted prior art (Fig. 1) in view of Sih (5646991), and further in view of Takahashi et al. (6891954).

As per **claim 13**, Nguyen discloses an audio system in a vehicle comprising a playback module Fig. 2 that comprises a cd player and tuner selectably coupled to an output speaker. Nguyen additionally discloses wireless cellphone 182 coupled to the same speaker. However Nguyen does not disclose applying an echo canceller to the phone in the car audio system, or a common output amplifier that is coupled to the outputs from all of the audio sources.

Applicant's admitted prior art in view of Sih discloses the echo canceller components that may be used in an in-car phone system (specification page 3) as per the claim 9 rejection. It would have been obvious to one of ordinary skill in the art at the time of this application to implement an echo canceller in the in-car phone system of Nguyen for the purpose of canceling unwanted echoes.

Takahashi discloses an in car audio system that comprises output amplifier 24 (Fig. 2) that accepts inputs from multiple input devices 11,12. Takahashi teaches that this configuration will allow for the input devices (such as the tuner or tape deck) to be easily

interchanged and the user can easily interface various input devices with varying output amplifiers. (Col 3 lines 15-55). The power amplifier is also implemented in order to provide a signal with enough power to drive the speaker (Col 2 line 60 to Col 3 line 20) It would have been obvious to one of ordinary skill in the art at the time of this application to implement a common buffer amplifier and output speaker amplifier for the purpose of providing a more universal interface and in order to provide enough power to drive the output speaker.

As per **claim 14**, both Nguyen and applicant's admitted prior art disclose cell phones that inherently require wireless transceivers for the purpose of performing the wireless phone functions.

As per **claim 15-17**, they are rejected as per the claim 13 rejection.

5. **Claims 7,8**, rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (Fig. 1) in view of Sih (5646991) as applied to claim 5, and further in view of Takahashi et al. (6891954).

As per **claim 7**, applicant's admitted prior art in view of Sih discloses the echo canceller system that may be implemented in a car phone, including microphone 70, speaker 50, D/A 40, A/D 60, but they do not specify an output amplifier.

Takahashi discloses an in car audio system that comprises output amplifier 24 (Fig. 2) that accepts inputs from multiple input devices 11,12. Takahashi teaches that this

configuration will allow for the input devices (such as the tuner or tape deck) to be easily interchanged and the user can easily interface various input devices with varying output amplifiers. (Col 3 lines 15-55). The power amplifier is also implemented in order to provide a signal with enough power to drive the speaker (Col 2 line 60 to Col 3 line 20). It would have been obvious to one of ordinary skill in the art at the time of this application to implement a common buffer amplifier and output speaker amplifier for the purpose of providing a more universal interface and in order to provide enough power to drive the output speaker.

As per **claim 8**, applicant's admitted prior art Fig. 1 discloses microphone 70 and speaker 50.

6. **Claim 12** rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al (US20040078104A1) in view of Applicant's admitted prior art (Fig. 1) in view of Sih (5646991) as applied to claims 9 and 10, and further in view of Lau et al. (6122506).

As per **claim 12**, Nguyen discloses an audio system in a vehicle comprising a playback module Fig. 2 that comprises a cd player and tuner selectably coupled to an output speaker. Nguyen additionally discloses wireless cellphone 182 coupled to the same speaker. However Nguyen does not disclose applying an echo canceller to the phone in the car audio system, or location hardware and software implemented with the cellular phone..

Applicant's admitted prior art in view of Sih discloses the echo canceller components that may be used in an in-car phone system (specification page 3) as per the claim 9 rejection. It would have been obvious to one of ordinary skill in the art at the time of this application to implement an echo canceller in the in-car phone system of Nguyen for the purpose of canceling unwanted echoes.

Lau teaches a combine cell phone and GPS system with microprocessor (which inherently comprises software to perform the phone and GPS functions (ABSTRACT). It would have been obvious to one of ordinary skill in the art at the time of this application to implement a GPS function in the phone of Nguyen for the advantage (inherent to a GPS system) of providing the user with location monitoring.

Response to Arguments

1. Applicant's arguments have been fully considered but they are not persuasive.

As per applicant's argument that the noise suppressor taught by Sih would not be placed after the pre-noise suppressor, examiner disagrees. Sih teaches that the filter receives a near-end signal+echo. The signal coming out of the pre-noise suppressor is still the near-end signal+echo because the echo has not yet been cancelled. Examiner contends it would have been obvious to use the filter before either echo cancelling stage. The filter, if located directly before the echo canceller would be located after A/D 60 (Fig. 1). The A/D may be read as pre-noise suppressor, as the act of digitizing will inherently filter out noise above a certain frequency. Examiner also contends that it

would have been obvious to provide well known cascaded noise suppression (as stated in applicant's spec) to provide reduced noise. A cascaded noise filtering circuit would comprise a 'pre-noise suppressor' and a 'noise suppressor'. Examiner also offers a third way of reading applicant's claim. Examiner contends that Sih's filter would be implemented before either the first or second echo cancellers in applicant's admitted prior art Fig. 1. When it is placed before the second echo canceller, then the first echo canceller will be the pre-noise suppression. Examiner notes that the signal coming out of the first echo canceller will still comprise near-end signal+ echo, because the first stage would not completely remove the echo from near-end signal+echo.

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Application/Control Number:
10/735,270
Art Unit: 2614

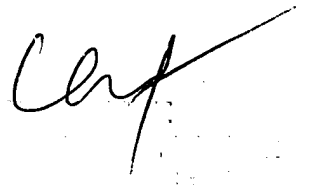
Page 11

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

Examiner Alexander Jamal

December 2, 2007

A handwritten signature in black ink, appearing to read 'Alex', with a long horizontal stroke extending to the right.